UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BROADMEDIA, INC.,
APPELLANT

Appeal 2008-0247
MERGED REEXAMINATION CONTROLS 90/007,213[1] and 90/007,408[2]
U.S. PATENT 6,012,951[3]
Technology Center 3900

Decided: 30 April 2008

Before JOHN C. MARTIN, LEE E. BARRETT, and MARK NAGUMO, *Administrative Patent Judges.*

NAGUMO, *Administrative Patent Judge.*

DECISION ON APPEAL

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[1] Request for reexamination filed 16 September 2004, by the patent owner.

[2] Request for reexamination filed 1 February 2005, by third party requester Baker Botts LLP.

[3] Cliff Krawez and Paul B. Ripy, *Phone Plug for a Phone Line System Including a Home Data Network*, issued 11 January 2000, based on application 09/191,883, filed 13 November 1998 ("951 patent").

A. Introduction

Patent owner Broadmedia, Inc. ("Broadmedia") appeals under 35 U.S.C. § 134(b) from the final rejection of claims 1–12, 14, 15, 17, and 18, which are all the pending claims in the merged reexamination of U.S. Patent 6,012,951. We have jurisdiction under 35 U.S.C. § 6. We AFFIRM.

The claimed subject matter relates to a jack for a phone line system that permits simultaneous voice and high frequency data transmission (e.g., Digital Subscriber Line (DSL)) over a phone line.

Claim 1, which is representative of the issues necessary to resolve this appeal, reads:

> An improved phone jack for a phone line system including a data network, said phone jack comprising:
>
> > a housing having a rear-receiving end and a plugging end,
> >
> > > a plug-receiving socket formed in said rear-receiving end and adapted to receive a modular phone plug,
> > >
> > > said plugging end being so formed that said plugging end can be plugged into a regular phone jack coupled to said phone line system including said data network;
> > >
> > > a number of inductors; and
> > >
> > > n number of conductors mounted in said housing and having first ends and second ends,
> > >
> > > > said first ends projecting into said plug-receiving socket for engaging a contact of said modular phone plug when said modular phone plug is inserted into said socket,

said second ends coupled passively and
respectively to said plugging end through
said inductors.

(Claims App. Br.[4] at 10-11; indentation and paragraphing added.)

The Examiner has maintained the following rejections[5]:

A. Claims 1–11, 14, and 17 have been rejected under 35 U.S.C. § 102(e) in view of Bingel.[6] (Ans. at 3-21.)

B. Claims 1–11, 14, and 17 have been rejected under 35 U.S.C. § 103(a) in view of the combined teachings of Bingel and Paradyne[7]. (Ans. at 21-24.)

C. Claims 10, 12, and 18 have been rejected under 35 U.S.C. § 103(a) in view of the combined teachings of Bingel, Paradyne, and DeLangis[8]. (Ans. at 24-26.)

The critical issue is whether the claimed phone jack, which comprises, *inter alia*, conductors having second ends "coupled passively and

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[4] Appeal Brief filed 23 March 2007.

[5] Examiner's Answer mailed 3 July 2007 ("Ans.").

[6] Thomas J. Bingel, *Passive Distributed Filter System and Method*, U.S. Patent 5,848,150 (8 December 1998), based on application 08/805,606, filed 26 February 1997.

[7] Paradyne™, *Hotwire 5038 Distributed POTS Splitter/Customer Premises Installation Instructions* (Document Number 5038-A2-GN 10-00) (February 1998).

[8] Eric DeLangis and Gary Stanish, *Plug Module for DSX Telecommunications Jack Module*, U.S. Patent 5,895,294 (20 April 1999), based on application 08/988,727, filed 11 December 1997.

respectively to said plugging end through said inductors," reads on the connectors described by Bingel, which have an "automatic control mechanism" between an inductor and the plugging end of the connector.

B. Findings of Fact (FF)

Findings of fact throughout this Decision are supported by a preponderance of the evidence of record.

The 951 Patent

1. According to the 951 patent, when telephones and high speed data communication devices share the same phone line system, the small capacitance presented by the telephones results in low impedance (loading effects) at the high frequencies characteristic of data transmission, which in turn degrades the data signals. (951 patent at 1:43-63 and at 2:4-6.)
2. The 951 patent offers a solution to this problem by connecting the telephone to the phone line system through inductors "so as to minimize the capacitance impact on the data communication." (951 patent at 2:26-31.)

3. The 951 patent describes an embodiment of the invention shown in Figure 4B, which is reproduced below:

{951 Patent Figure 4B is shown below}[9]

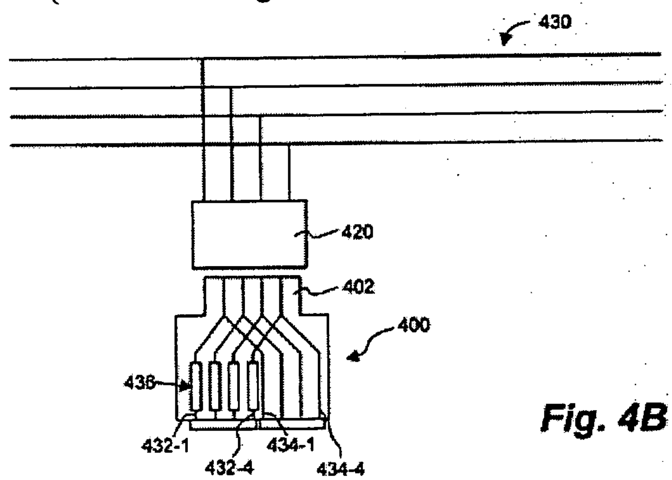

Fig. 4B

{951 Patent Figure 4B is said to show a connector of the invention.}

4. In the words of the 951 patent:

> FIG. **4B** shows an internal layout of improved phone plug **400**. When plugging end **402** is plugged into a phone jack **420**, connectors **432** and **434** in plug-receiving sockets **406** and **408** are coupled to phone line system **430** in which a data network is implemented. More specifically, each of connectors **432** in plug-receiving sockets **406** is coupled to one of the connectors in phone plug **400** through an inductor [436] while <u>connectors **434** are directly and respectively coupled to the connectors in phone plug **400**</u>.

(951 patent at 5:13-22; emphasis added.)

5. Assuming typical values for voltages, impedances, and frequencies, the 951 patent calculates that the actual voltage received by the receiver

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[9] The text in curly braces before and after the Figures is provided to ensure compliance with section 508 of the U.S. Rehabilitation Act for publication of this Decision on the USPTO Website pursuant to the Freedom of Information Act. It is not part of the Decision.

through the circuit of Figure **4B** is approximately 1.18 volts, which is said to be "close to the actual voltage available to the interface." (951 patent at 4:63 to 5:6.)

6. "In other words," the 951 patent concludes, "the data signals received for data communication have not been considerably degraded." (951 patent at 5:7-8.)

7. In the paragraph immediately preceding the description of Figure **4B**, the 951 patent states, "[i]t may be appreciated by those skilled in the art that the introduction of passive inductance circuits or simply inductors in the phone plug maintains the signals quality in data communication meanwhile the quality of voice communication is not affected." (951 patent at 5:9-13.)

8. The 951 patent does not appear to contain an express definition of the term "coupled passively."

Bingel

9. Bingel describes a "passive distributed filter system" that is intended to enable "reliable and efficient decoupling of two simultaneous communications channels on a telephone connection at a plurality of sites." (Bingel at 1:26-29.)

10. In particular, the system is said to be particularly suited for decoupling a "plain old telephone system (POTS)" from a high speed digital communications channel, such as a digital subscriber line (DSL). (Bingel at 1:29-38.)

11. Bingel calls the system a "distributed POTS filter (DPF)." (Bingel at 1:38-40.)

12. According to Bingel, it is known to use a POTS splitter to decouple the voice and data channels. (Bingel at 1:55.)

13. Bingel indicates that a POTS splitter is typically a passive or active one-to-two port device that includes a low pass filter to minimize high frequency transients produced by on-hook/off-hook transitions, and is also configured to provide a high impedance to the telephone line in the ADSL frequency band. (Bingel at 1:55-64.)

14. As a result of these requirements, POTS splitters are said to be expensive and to require installation by a skilled telephone company worker. (Bingel at 1:64-2:3.)

15. According to Bingel, the advantages of the inventive distributed POTS filter include its simple design, efficient operation, and ease and economy of mass scale manufacturing (Bingel at 3:35-37) from "very low cost passive components" (*id.* at 3:49-50).

16. In Bingel's words, "[e]ach distributed filter comprises a <u>passive</u> automatic control mechanism and a <u>passive</u> first channel filter (e.g., a POTS filter)." (Bingel at 2:37-39; emphasis added.)

17. Bingel describes an embodiment of its invention in Figure 4, which is reproduced below:

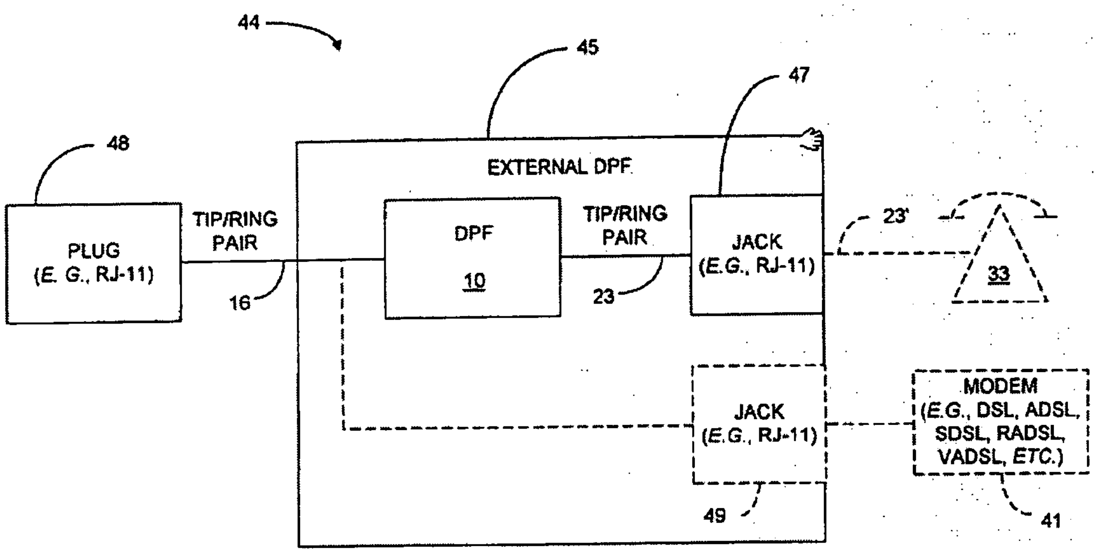
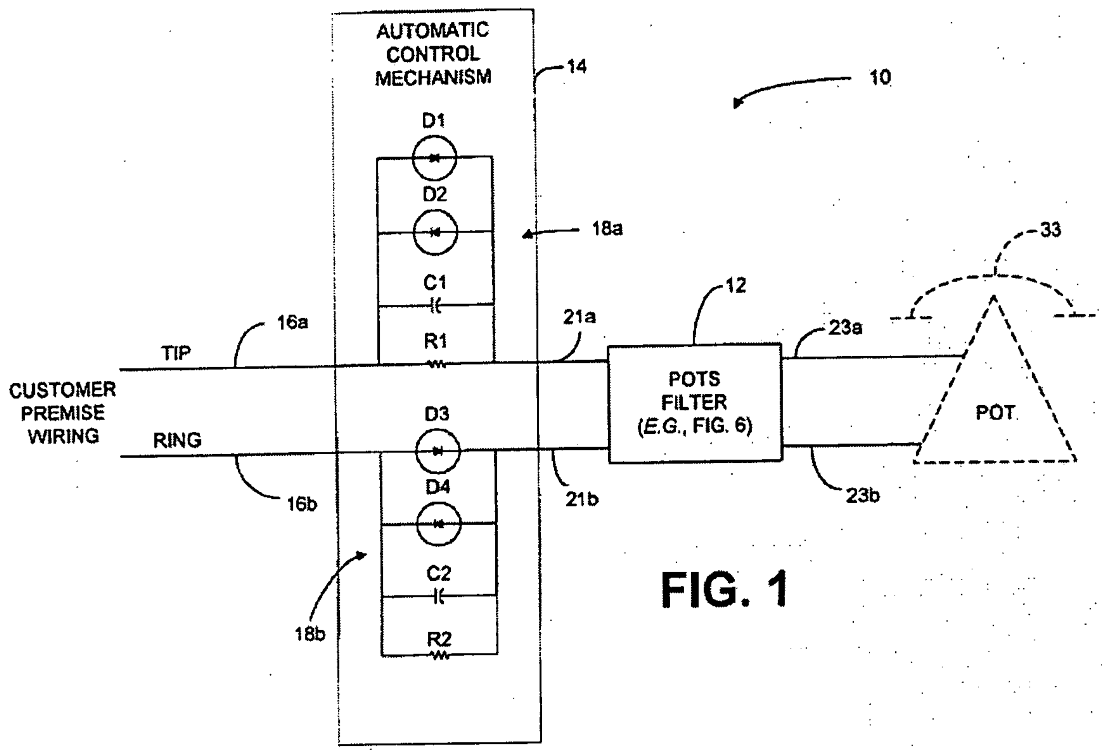


FIG. 4

{Bingel Figure 4 is said to show an external Distributed POTS Filter (DPF).}

18. According to Bingel, Figure 4 illustrates a DPF external to a telephone, the DPF **10** being in a housing **45**, electrically connecting two ports, jacks **47** and **49** (e.g., RJ-11, a standard phone jack), and plug **48** (e.g., RJ-11, a standard phone plug). (Bingel at 6:31-40.)

19. Bingel describes an embodiment of DPF **10** that is illustrated in Figure 1, which is reproduced below:



{Bingel Figure 1 is said to show a Distributed POTS Filter (DPF).}

20. As shown in Figure 1, DPF **10** is comprised of two parts, a POTS filter **12** and an Automatic Control Mechanism **14**.

21. Bingel describes the POTS filter **12** in terms of the embodiment **12'**, which is said to have excellent sidetone performance, and which is shown in Figure 6, reproduced below:

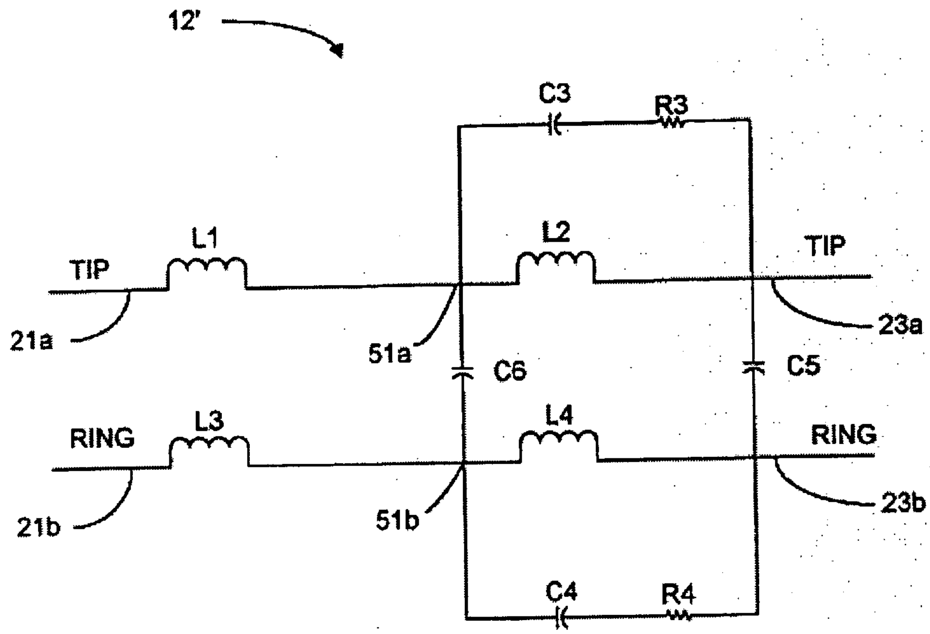


FIG. 6

{Bingel Figure 6 is said to show a POTS filter.}

22. According to Bingel:

> [w]hen the improved POTS filter **12'** is operational, the inductors **L1**, **L3** provide high impedance to high frequencies, particularly those frequencies in the ADSL band. The capacitors **C3**, **C4** resonate with the inductors **L2**, **L4** in order to parallel resonate at the geometric mean of about 1 KHz and about 3 KHz. This feature improves telephone sidetone performance in the 1 to 3 KHz band by improving impedance (restoring the resistance and capacitive reactance) presented to the telephone **33**.

(Bingel at 7:44-52.)

23. According to Bingel, "[t]he automatic control mechanism **14** is configured to automatically either isolate or interface the POTS filter **12** (in the telephony voice spectrum) based upon the off-hook/on-hook status." (Bingel at 4:40-43.)

24. Bingel explains the functionality of the automatic control mechanism circuit elements when a telephone is "on-hook" (hung up) as follows:

> When a telephone or other POTS communications device **33** is on-hook, the direct current (DC) resistance of the POTS communications device **33** is greater than 5 MΩ. In this event , very little current is drawn from the customer premise wiring **16**, and the diodes **D1**-**D4** of FIG. 1 are essentially unbiased. Unbiased diodes present a high alternating current (AC) impedance in series with the POTS filter **12**, thereby disconnecting (or isolating) the POTS filter **12** (and associated loading) from the customer premise wiring **16**. This reduction in loading significantly reduces transmission loss and reduces sidetone degradation. In addition, the resistors **R1**, **R2** shunt the leakage circuit around the diodes **D1**-**D4** in the on-hook state, yet are a high enough impedance to maintain the POTS filter **12** in isolation from the customer premise wiring **16**.

(Bingel at 4:65-5:12.)

25. When the phone is "off-hook," Bingel explains that

> a DC current in the range of between about 20 mA to about 100 mA is drawn from the customer premise wiring **16** through either the diodes **D1**, **D4** or the diodes **D3**, **D2**, depending upon the polarity of tip and ring lines **16a**, **16b**. The parallel opposing diode pairs **D1**, **D2**, and **D3**, **D4** ensure that a forward bias condition will exist on the diode pairs, regardless of the polarity of the tip and ring lines **16a**, **16b** (tip and ring reversal).

(Bingel at 5:20-28.)

26. Consequently, according to Bingel:

> The forward biased diodes, for example, **D1** and **D4** when the tip line **16a** is positive with respect to the ring line **16b**, present a very low AC impedance (approximately, 2Ω) to the voice signal. The total forward DC voltage drop (1.4 volts DC at 20 mA) minimally impacts telephone performance. Further, the capacitors **C1**, **C2** are designed to shunt high frequencies (such as DSL frequencies) around the diodes in order to minimize distortion. The DSL frequencies therefore experience the linear high impedance of the POTS filter **12** at tip and ring lines **21a**, **21b**.

(Bingel at 5:28-37.)

27. We do not find it necessary to describe Paradyne or DeLangis.

C. Discussion

Claimed subject matter is anticipated by a prior art reference if "the claims under attack, as construed by the court, 'read on' something disclosed in the reference, i.e., all limitations of the claim are found in the reference, or 'fully met' by it." *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 772 (Fed. Cir. 1983).

The burden is on Broadmedia, as the appellant, to demonstrate reversible error in the Examiner's findings of fact or conclusions of law. *See Gechter v. Davidson*, 116 F.3d 1454, 1460 (Fed. Cir. 1997) ("[W]e expect that the Board's anticipation analysis be conducted on a limitation by limitation basis, with specific fact findings for each *contested* limitation and satisfactory explanations for such findings.") (emphasis added).

The Examiner finds that Bingel describes a passive distributed filter system that enables simultaneous voice and data communications over the

same phone line. The Examiner finds further that the Bingel system meets all the limitations of the subject matter of claims 1-11, 14, and 17. (Ans. at 3-21.)

Broadmedia directs its arguments for patentability to the limitations of claim 1, urging that the same errors apply to the Examiner's rejections of the other claims. We shall therefore direct our attention to claim 1, with which the remaining claims stand or fall.

Broadmedia argues first that the Examiner erred in finding that Bingel describes a passive filter system—in particular, that the automated control mechanism (hereafter, "ACM") **14** is a passive filter. (Br. at 4-6.) In particular, Broadmedia argues that diodes are active components, and that the ACM is therefore an active component. (Br. at 5.) In support of its argument, Broadmedia presents a Web page from Wikipedia, which lists diodes as examples of active components, and a Web page of a supplier of components that also lists diodes as active components. (*Id.* at 5-6.) As for Bingel's use of the term "passive," which Broadmedia acknowledges is used "explicitly in the title, abstract, summary of the invention, and many other places" (*id.* at 6), Broadmedia argues that "Bingel means largely the POTS Filter 12." (*Id.*)

This argument is not persuasive. First, Bingel states that "[e]ach distributed filter comprises a passive automatic control mechanism and a passive first channel filter (e.g., a POTS filter)." (Bingel at 2:37-39; emphasis added: FF 15.) This direct description of ACM **14** as a passive device cannot be dismissed without explanation. Moreover, the *Wikipedia* page cited by Broadmedia provides the following definition of the term

"active": "in electronics, an active component is one that can be used to provide gain in an electronic circuit." (*See* the *Wikipedia* page, reproduced at Br. at 5.) Broadmedia has not, however, directed our attention to any disclosure in Bingel or any other reference that indicates that gain plays any role in the high frequency high impedance characteristics of unbiased diodes (Bingel at 5:3-5; FF 21) or in the low frequency low impedance characteristics of forward biased diodes (Bingel at 5:28-31: FF 23) that together are responsible for the filtering capabilities of ACM **14**. In other words, there appears to be no evidence that the diodes in ACM **14** function as active (gain-inducing) components.

Bingel's description of ACM **14** as a passive filter appears to be consistent with the Wikipedia definition of an active device. We also note the following passage from a prominent recent electronics textbook:

> The circuit elements we've discussed so far (resistors, capacitors, and inductors) are all *linear*, meaning that a doubling of the applied signal (a voltage, say) produces a doubling of the response (a current, say). This is true even for the reactive devices (capacitors and inductors). These devices are also *passive*, meaning that they don't have a built-in source of power. And they are all two-terminal devices, which is self explanatory.
>
> <u>The diode</u> (Fig. 1.66) is a very important and useful two-terminal <u>passive non-linear device</u>.

Paul Horowitz and Winfield Hill, *The Art of Electronics* 44 (2d ed. 1989) (underscore added). Even more explicit is the following passage:

> The electronic components encountered thus far have all been of a class referred to as *passive* devices. Resistors, capacitors, inductors, and <u>diodes</u> can all *limit* currents in various ways, and transformers can even increase voltage at the expense of

> current, but none of these devices can produce a higher-powered output signal than the input signal it receives. Devices which can perform this feat are called *active* components.

Daniel L. Metzger, *Electronic Circuit Behavior* 56 (2d ed. 1983) (underscore added).

The evidence weighs heavily in favor of the Examiner. Broadmedia's lack of explanation as to why ACM **14** must be an active filter is therefore fatal to this part of its argument. Accordingly, we find that Broadmedia has failed to show error in the Examiner's finding of fact that ACM 14 is a passive filter, as described by Bingel.

Broadmedia argues next that the Examiner read its claims too broadly. In Broadmedia's words:

> However the Specification of the pending case <u>does not describe</u>, either explicitly or implicitly, an automatic control mechanism that must be needed to achieve what is contemplated in the invention, the Examiner appeared to insist that any passive filter or circuit, whether it works with or without a phone jack via an active circuit, can be read upon by Claims 1, 6 and 8.

(Br. at 7.) Here, Broadmedia fails to recognize that during prosecution, "the PTO applies to the verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant's specification." *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

Claim 1 (and the other independent claims) requires that "said second ends [of the conductors are] coupled passively and respectively to said plugging end through said inductors." As long as the coupling to said plugging end is (a) passive and (b) through said inductors, the limitation is met. The silence of the 951 specification as to such other components cannot be read into the claims as a limitation on the scope conferred by the "coupled passively" phrase.

Our interpretation is supported further by the description in the 951 specification of an embodiment in which "connectors **434** are directly and respectively coupled to the connectors in phone plug **400**." (951 patent at 5:18-22; emphasis added; FF 4.) Here, the recitation of a direct connection precludes any intervening element between connector **434** and plug **400**. Clearly, Broadmedia knows how to specify an exclusive and direct connection between components. As our reviewing court remarked in a similar circumstance, when a patent owner was confronted by a claim construction broader than the patentee had intended, if Broadmedia, "who was responsible for drafting and prosecuting the patent, intended something different, it could have prevented this result through clearer drafting." *Hoganas AB v. Dresser Indus., Inc.*, 9 F.3d 948, 951 (Fed. Cir. 1993).

Accordingly, we hold that the claims do not exclude the presence of circuit elements in addition to the recited inductor, between the conductor and the plug, as long as the additional circuit elements are passive.

Broadmedia asserts further that the Examiner erred by failing to take into account Broadmedia's disclaimer of the automatic control mechanism, which was filed in its Response on 21 November 2005. (Br. at 8.) This

argument has no merit. As Broadmedia recognizes in its next argument, it is the specific language of the claims that defines the invention. (*Id.*) Limitations are not to be read from the disclosure into the claims. Moreover, the weight accorded during prosecution to an applicant's remarks about what it intends its claims to cover depends on the persuasiveness of those remarks as to what one of ordinary skill in the art would under stand the plain meaning of the claims to be.[10] During prosecution, in any event, such comments, unless supported by evidence of the meaning of the claim to those skilled in the art, cannot alter the plain meaning of the words of the claim.

Finally, Broadmedia argues that Bingel describes a filter in which the allegedly active element ACM **14** is a required element of the disclosed DPF. In Broadmedia's view, Bingel therefore does not teach or suggest a housing that encloses passive components or any structure that includes only passive components with a plugging end and a receiving end. (Br. at 9-10.) We have found that ACM 14 is a passive element. Broadmedia admits that Bingel describes a housing as enclosing DPF **10** (Br. at 9, last paragraph), and we have found that DPF 10 is a passive device. Accordingly, we find Broadmedia's final argument unpersuasive. For the foregoing reasons, we AFFIRM the rejection of claims 1-11, 14, and 17 under § 102(e) in view of Bingel. The rejection of these claims under § 103(a) in view of the combined teachings of Bingel and Paradyne is therefore affirmed

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[10] Such remarks may have more weight as "prosecution estoppel" when a court is construing a patented claim, as the remarks may be evidence of the meaning the Examiner assigned to the claim.

summarily, as "lack of novelty is the epitome of obviousness." *In re May*, 574 F.2d 1082, 1089 (CCPA 1978).

Broadmedia does not raise different arguments for the patentability of any of dependent claims 10, 12, and 18 with respect to the rejection for obviousness in view of the combined teachings of Bingel and the other references. (Br. at 10, last paragraph.) Accordingly, that rejection is also AFFIRMED.

E. Summary

In view of the record and the foregoing considerations, it is:

ORDERED that the rejection of claims 1–11, 14, and 17 under 35 U.S.C. § 102(e) in view of Bingel is AFFIRMED;

FURTHER ORDERED that the rejection of claims 1-11, 14, and 17 under 35 U.S.C. § 103(a) in view of the combined teachings of Bingel and Paradyne is AFFIRMED;

FURTHER ORDERED that the rejection of claims 10, 12, and 18 under 35 U.S.C. § 103(a) in view of the combined teachings of Bingel, Paradyne, and DeLangis is AFFIRMED.

AFFIRMED

cc (via first class mail):

SILICON VALLEY PATENT AGENCY (Patent Owner)
7394 Wildflower Way
Cupertino, CA 95015

Kurt M. Pankratz (Third Party Requester)
BAKER BOTTS LLP
2001 Ross Avenue, Suite 600
Dallas, TX 75201

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DANIEL L. METZGER

Monroe County Community College
Monroe, Michigan

PRENTICE-HALL, INC., *Englewood Cliffs, New Jersey 07632*

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TRANSISTOR CHARACTERISTICS

4.1 THE TRANSISTOR CONCEPT

The electronic components encountered thus far have all been of a class referred to as *passive* devices. Resistors, capacitors, inductors, and diodes can all *limit* currents in various ways, and transformers can even increase voltage at the expense of current, but none of these devices can produce a higher-powered output signal than the input signal it receives. Devices which can perform this feat are called *active* components. The chief modern-day representative of this class is the transistor.

Of course, transistors are not capable of making high-power signals directly out of low-power signals—the action is better described by saying that a small input current is used to control a large output current. Then it is clear that there must be a relatively large source of current (battery or power supply) to supply the energy of the output signal.

The number of devices that are referred to loosely as *transistors* has increased considerably since the original device was introduced, so it may be advisable to state specifically that we are here concerned with the *bipolar* transistor (also called a bijunction transistor or BJT), as opposed to the newer types which are still less popular. The bipolar transistor is basically a pair of back-to-back diodes which share a common piece of semiconductor material between them. The interaction of these two closely tied diodes causes some remarkable effects which would not be noticed if two separate diodes were used, however. This internal action is not easy to visualize, and a detailed discussion of its exact nature at this point would only tend to obscure the main point of how a transistor behaves as a current-controlling device. Therefore, a superficial

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1.24 Thévenin's theorem generalized

When capacitors and inductors are included, Thévenin's theorem must be restated: Any two-terminal network of resistors, capacitors, inductors, and signal sources is equivalent to a single complex impedance in series with a single signal source. As before, you find the impedance and the signal source from the open-circuit output voltage and the short-circuit current.

DIODES AND DIODE CIRCUITS

1.25 Diodes

The circuit elements we've discussed so far (resistors, capacitors, and inductors) are all *linear*, meaning that a doubling of the applied signal (a voltage, say) produces a doubling of the response (a current, say). This is true even for the reactive devices (capacitors and inductors). These devices are also *passive*, meaning that they don't have a built-in source of power. And they are all two-terminal devices, which is self-explanatory.

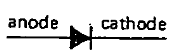

Figure 1.66. Diode.

The diode (Fig. 1.66) is a very important and useful two-terminal passive *nonlinear* device. It has the *V–I* curve shown in Figure 1.67. (In keeping with the general philosophy of this book, we will not attempt to describe the solid-state physics that makes such devices possible.)

The diode's arrow (the anode terminal) points in the direction of forward current flow. For example, if the diode is in a circuit in which a current of 10mA is flowing from anode to cathode, then (from the graph) the anode is approximately 0.5 volt more positive than the cathode; this is called the "forward voltage drop." The reverse current, which is measured in the nanoamp range for a general-purpose diode (note the different scales in the graph for forward and reverse current), is almost never of any consequence until you reach the reverse breakdown voltage (also called the peak inverse voltage, PIV), typically 75 volts for a general-purpose diode like the 1N914. (Normally you never subject a diode to voltages large enough to cause reverse breakdown; the exception is the zener diode we mentioned earlier.) Frequently, also, the forward voltage drop of about 0.5 and 0.8 volt is of little concern, and the diode can be treated as a good approximation to an ideal one-way conductor. There are other important characteristics that distinguish the thousands of diode types available, e.g., maximum forward current, capacitance, leakage current, and reverse recovery time (see Table 1.1 for characteristics of some typical diodes).

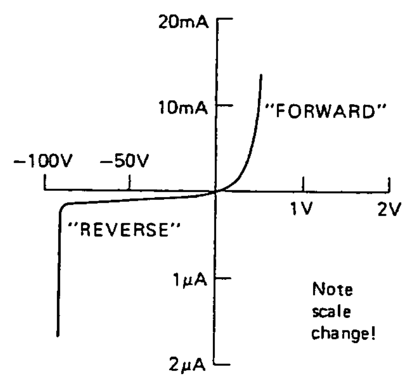

Figure 1.67. Diode *V–I* curve.

Before jumping into some circuits with diodes, we should point out two things: (a) A diode doesn't actually have a resistance (it doesn't obey Ohm's law). (b) If you put some diodes in a circuit, it won't have a Thévenin equivalent.

1.26 Rectification

A rectifier changes ac to dc; this is one of the simplest and most important applications of diodes (diodes are sometimes